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Characteristics of the rocks glacier deposits in the Southern Carpathians, Romania

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Abstract : As a distinct part of the mountain system, the rock glacier system is a particularly periglacial debris system. Being an open system, it works in a manner of interconnection with others subsystems like glacial, cliffs, rocky slopes sand talus slope subsystems, which are sources of sediments. One characteristic is that for long periods of time it is like a storage unit for debris, and ice, and temporary for snow and water. In the Southern Carpathians 306 rock glaciers were identified. The vast majority of these rock glaciers, are talus rock glaciers, 74%, and 26%, are debris rock glaciers. In the area occupied by granites and granodiorites are present, 49% of all the rock glaciers, representing 61% of the area occupied by Southern Carpathians rock glaciers. This lithological dependence also leaves its mark on the specifics of the deposits, everything bearing the imprint of the particular way the rocks respond to the physical weathering processes, all in a periglacial regime. If in the domain of granites and granodiorites the blocks are large, - of metric order, even 10 m3 - , in the domain of the metamorphic rocks only gneisses can cut similar sizes. Amphibolites, amphibolitic schists, micaschists, sericite-chlorite schists and phyllites crop out in much smaller blocks, of decimetric order, mostly in the form of slabs. In the case of rock glaciers made up of large blocks, with a strcture of open-works type, the density and volume of voids between the blocks is greater, the smaller debris generating more compact structures with fewer voids. All these influences the thermal regime, associated with a certain type of air circulation during the seasons and the emergence of permafrost formation conditions. The rock glaciers are fed by rock falls, rock avalanches, debris flows, avalanches, so that the structure is heterogeneous, which is also reflected in the detailed topography of the rock glaciers. This heterogeneity is also influenced by the spatial assembly of the rock bodies in the supply area and, an element that cannot be omitted, the behavior of the rocks during periglacial weathering. The production of small gelifracts determines the filling of voids and the appearance of more compact structures, with effects on the creep process. In general, surface deposits are coarser, those in depth are finer, their characteristics being detectable by applying geophysical methods. The electrical tomography (ERT) and georadar (GPR) investigations carried out in the Făgăraş Mountains, Retezat and the Parâng Mountains, each with a different lithological specificity, allowed the identification of some differentiations, including the presence of permafrost bodies.

Keywords : rock glaciers deposits, structure, lithology, permafrost, Southern Carpathians, Romania
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